the confirmation of clinical experience, to vastly increase our knowledge of the etiology of disease.

The writer feels that this important subject has been treated by him somewhat imperfectly, but as fully as his experience thus far warrants. The important practical bearings of the matter herein discussed must be his excuse for bringing it at this time to the notice of the profession.

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ARTICLE II.

TYPHO-MALARIAL FEVER, THE SO-CALLED "MOUNTAIN" FEVER OF THE ROCKY MOUNTAIN REGION.

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IF there be a disease peculiar to the Rocky Mountain system, its investigation and accurate determination become each day of greater public importance, for even now the waves of civilization are lapping to the base of the Rockies, and soon its swelling tide will overflow the whole region. From time to time there have appeared in American medical periodicals articles under the caption "Mountain Fever," giving description of a febrile disease of somewhat peculiar character, which apparently is indigenous to the country vaguely denominated the Rocky Mountain region. Owing doubtless to the sparseness of population, the rarity of the disease, and, not least, the fact that the pioneers of our profession in this extreme western country are, as a rule, workers, not recorders, the literature of the subject is extremely meagre. The weight of authority, so far as evidence is obtainable, seems to be in favor of a malarial causation. Assistant-Surgeon Charles Smart, U. S. Army, in his very instructive paper on "Mountain Fever and Malarious Waters," says:[1] . . . "Mountain fever is not dependent upon any peculiar mountain miasma, but is a malarial remittent with adynamic tendencies." He further says:[2] "If . . . disease be permitted to run unchecked for a few days the patient falls into a condition undistinguishable from typhoid, and which often proves fatal," etc. Surgeon E. P. Vollum, U. S. Army, writes:[3] "It is a malarial fever commencing as an intermittent, passing on to a remittent, then into a typhoid condition."

Surgeon J. L. Town, and Assistant-Surgeon J. D. Hall, U. S. Army, state that at Fort Shaw, Montana,[4] "remittent and typho-malarial, and probably enteric fevers, are not infrequent in the spring and fall; . . . these, in the parlance of the country, are termed mountain fevers indiscriminately." Other medical officers with whom we have had opportunity to consult, express the opinion that the disease is of remittent character, of malarial origin; an opinion which seems to be very generally acquiesced in, judging from the comparatively large number of cases of remittents reported from posts within the Rocky Mountain belt. So far, then, as has been determined, we recognize under the term "mountain" fever a disease beginning as an intermittent, continuing (?) as a remittent, and ending in typhoid, or, as Dr. Smart[5] formulates it, 1st, "a primary stage of one, two, or more weeks during which the individual is more or less oppressed by the influence of the *materies morbi;* 2d, the development of fever, more or less marked, and more or less rapid in its course, with irregular remissions, and much more mental depression and muscular prostration than the patient's pulse and temperature would prepare the observer to find;" 3d, "a typhoid stage, marked by prostration, emaciation, low delirium, and coma vigil."

With a view to assisting in the accurate determination of a question which is certainly now *sub judice*, and regarding which positive conclusion can be reached only through carefully recorded clinical histories and anatomico-pathological examinations, we present the notes of five cases of so-called "mountain" fever which fell under observation at Fort Fetterman, Wyoming, in the autumn of 1878. Late in the spring of 1878, eight companies of cavalry, four from stations on Union Pacific Railroad, and four from post on extreme frontier, rendezvoused at Fort McKinney, Wyoming, thence marched to Clear Creek, Wyoming, and went into permanent camp. We are indebted to Dr. A. J. Gray, U. S. A., chief medical officer of the column, for the following:—

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[1] American Journal of the Medical Sciences, January, 1878.

[2] Circular No. 8, War Dep't, Surgeon-General's Office, 1875.

[3] Idem.

[4] Idem.

[5] American Journal of the Medical Sciences, January, 1878.

"Our command, consisting of two battalions 5th Cavalry, numbering in all about five hundred men, took the field May 24, 1878, 'as a party of observation' in the Powder River country. Not a man was sick in starting. The command was splendidly equipped; ample and suitable clothing and tentage, and abundant rations. The *morale*, moreover, could not have been better. The first permanent camp was reached June 14. It was located on the Clear Fork of Powder River, three miles from the eastern base of the Big Horn Mountains, at the point where they reach their highest elevation, viz., 12,000 feet, and are covered by perpetual snow. The camp was on a grassy plateau, twenty-five feet above the level of the stream, with sufficient incline to secure free surface drainage, the soil being a gravelly drift without alluvium. Clear Fork, from which the water-supply was furnished, takes its rise in the 'Ice Lakes' (glaciers), at the base of the granite crest of the mountains, and flows rapidly by many small streams for ten miles through a dense pine forest, all the streams then uniting to pass through a gorge or narrow cañon, from which it rushes over rocks and boulders, making one continuous line of foam five miles to our camp, where the stream has an average width of twenty feet, and depth of eighteen inches. The water is soft, clear, and pleasant to the taste, except that late in the season there was a suspicion of vegetable infusion. The temperature of the water was at no time above 50° Fahr. The command remained in this camp until July 15—one month—during which a few cases of intermittents appeared, in all of which there was a history of previous malarial toxemia. There were many cases of disease of the digestive organs, responsibility for which, in my opinion, largely rests with the sutler. There were also a few cases of acute rheumatism.

"The second camp was on Rock Creek, four miles north of the previous site, and differing therefrom in no important characteristic, nor was there any noticeable change in the sick report. The duties of the men were light. Scouting parties were sent out during the summer in various directions, composed of from one to four companies. There were occasional drills, and the usual guard duty. The atmospheric temperature was equable, and never oppressive. Showers were of almost daily occurrence through the entire season.

"On the 5th of September orders were received to cross the mountains to the southwestward, to intercept hostile Indians coming down from the Yellowstone National Park. This movement necessitated a reduction of all extra clothing and rations, and the use by the men of the so-called 'shelter' tent, which falls far short of affording protection against severe weather, such as was experienced in this movement. On the seventh the eastern crest was crossed, and camp made in a well-watered natural clearing at an altitude of about 9000 feet. Toward evening a cold rain began to fall, which at 2 o'clock A. M. turned to snow, and continued all through the next day's march, falling to the depth of twelve inches or more on a level. The storm continued during the night of the 8th, but we left it early in the evening by coming down out of it into clear weather, on the west side of the range, into the valley of Painted Rock River. During the 9th our march lay down the valley of the stream, or rather across its numerous tributaries, all turbid and swollen from the melting snow, which had just fallen on the mountains, and which, let me say, was the first snow since the previous spring. On the 10th and 11th the command crossed the Owl Creek Mountains, also covered with snow recently fallen, and on the 12th reached the Wind River. Since the 7th the command had marched over high mountain ranges, by an unfrequented trail, where there was no possibility of encountering the results of animal decomposition, and where there were no marshes, and little vegetation of any kind aside from the pine forests. The water-supply had all the time been from the melting snow. The health of the men continued good until the night of the 12th, when the first case of intermittent developed in a strong young soldier of good habits (Case IV.). The trouble yielded readily to large doses of quinia-sulphate, and he was able to resume duty on the 16th.

"Camp Brown, which the column reached September 14, is situated at the eastern base of the Wind River Mountains, and is surrounded by no unfavorable sanitary condition; on the contrary, the physical characteristics are eminently favorable to healthfulness, which is abundantly attested by the condition of the garrison stationed there. The command, to which the writer was attached, remained at this place five days, during which occurred three peculiar cases of sickness, one being that before mentioned, and the two others men who were left at the hospital at Camp Brown, when we started on our homeward march, September 19. On the morning of the 20th, a fourth case of this disease presented, and the subject sent back to hospital. These cases I have not since heard from. Our return march was by the well-known Sweetwater trail, and was made under conditions in every way favorable to healthfulness; yet several cases of the disease developed during the march to Fort Fetterman.

"These cases all presented the same general phenomena in the beginning. Invariably the first complaint was that of feeling cold, and 'aching all over.' Then there was loss of appetite, thickly coated tongue, and constipated bowels. The disease was in no instance ushered in with a well-marked chill, and during the first twenty-four hours the fever was always light; but there was mental obscuration, sometimes delirium, and more or less inertia, the subjects seeming not to care whether they lived or died, or what was done with or for them. The patients always admitted a feeling of distress, but never could localize it, except in one case (the man who subsequently died at Fort Fetterman, who complained greatly of pain in his head and the 'back of his neck'). The fever once developed, never after wholly left the patient, but exhibited a decided daily exacerbation, beginning with *chilliness* for a period of half an hour or so, accompanied by cold, clammy sweat, and followed by an intensely hot skin, with small and rapid pulse. These exacerbations generally continued about eight hours, sometimes longer, and then would follow a period of eight or ten hours of lower temperature and comparative freedom from discomfort, during which sleep was possible. There was an increasing, but not a great degree of prostration, as every man was able to ride his horse during the day's march of eighteen to twenty-five miles, and continued to do so daily without assistance until Fort Fetterman was reached. There were wanting the distinctive symptoms characteristic of typhoid, and yet quinia seemed to have no effect to prevent or control the daily returns of the high fever, though administered in large doses."

The command reached Fort Fetterman Sept. 28th, and Dr. Gray transferred to this Hospital the following cases, the most serious of those under treatment.

Cases I. and III.—Tertian Intermittent Fever.

Case II.—Remittent Fever.

Cases IV. and V.—Quotidian Intermittent Fever.

CASE I.—Aged 22; family history good; strong physique; never had any serious illness; temperate habits; first taken sick September 6th, 1878 (while en route to Camp Brown, Wyoming) with severe headache, fever and pain in abdomen; no chill or epistaxis; had fever for short time daily for five or six days; upon reaching Camp Brown, felt much better, but febrile condition continued, and, with resumption of march, headache again became severe. Treatment, quinia. Admitted to hospital September 29th; complained of no pain, but felt debilitated; was anæmic, though in good flesh and spirits; conjunctiva and skin clear; hearing normal; tongue heavily covered with whitish glazed coat, which, disappearing at tip and edges, left a clearly-defined pinkish border; thoracic and abdominal viscera normal; no tenderness over liver, spleen, or caput coli, and no eruption on body; pulse full and soft; urinary secretions normal; appetite good. We regarded this case as a mild though typical form of "mountain" fever, and, that its symptoms might not be modified by medication, the treatment was purely placeboic—Aquæ lavandul., ℥ss, three times a day.

The history of the case presents nothing of interest other than that of simple continued or sub-continued fever. The temperature chart is shown in the accompanying plate. There was a daily sweat, but no chill, and the sweat was not very copious; no pain in head (save for a day or so after entering hospital) or abdomen, and at no time after admission any tenderness of spleen or liver, and no cutaneous eruption. The bowels were slightly constipated, but so slightly that cathartics were found necessary only twice during the time the case was under observation.

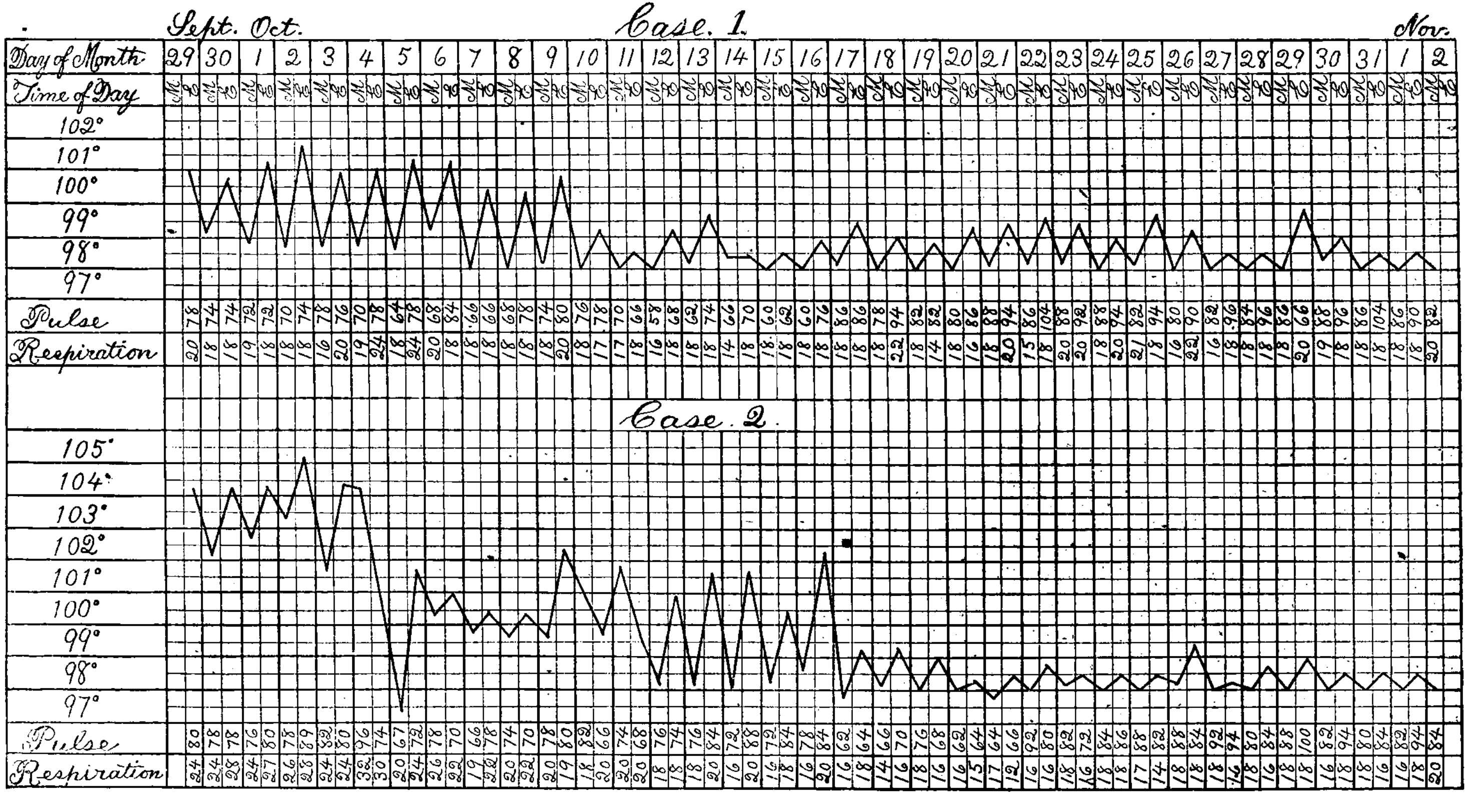
CASE II.—Aged 30; strong constitution; no history of previous illness; of temperate habits; was taken sick September 20th, upon leaving Camp Brown; complained of headache, anorexia, general debility, with constipation; had daily chill, fever, and sweat until 28th, when fever became continued; had not been ill before during campaign, and never had intermittent fever. Admitted to hospital September 29th. Patient fairly well nourished; of spare habit; conjunctiva injected; countenance flushed, skin dry; lips swollen and cracked; tongue thick, swollen, fissured, and heavily coated at centre, clear and red at tip and edges; mouth filled with thick viscid saliva; taste bad; breath offensive; thorax clear on percussion; complains of pain at lower portion of both lungs on taking full breath; respiration rough, with mucous and subcrepitant râles; expectoration stringy and slightly streaked with blood; liver and spleen somewhat enlarged and painful on palpation; abdomen generally tender; micturition painful; urine scanty and high colored; bowels constipated; mind clear; cephalalgia excruciating; pain referred principally to occiput, seemed to extend downward, causing patient to assume characteristic posture of cerebro-spinal meningitis; hearing obtunded.

29th. Potassii bromid. et chloral hydrat., āā gr. xv at once, to be followed by Magnes. sulph., ℥ss, and simple enema: milk diet.

30th. Passed restless night; headache continued; no appetite; bowels moved freely. Ipecac., gr. xv every 3 hours. This remedy was used purely tentatively.

The temperature record is given in the accompanying plate.

Having several cases under treatment at the same time, we determined to study the action of different remedies to ascertain as certainly as pos-



Day of Month	Time of Day	Case. 1. Pulse	Case. 1. Respiration	Case. 2. Pulse	Case. 2. Respiration
Sept. 29	M				
	E	78	20	80	24
30	M	74	18	78	24
	E	74	18	78	28
Oct. 1	M	72	19	76	24
	E	72	18	80	27
2	M	70	18	78	26
	E	74	18	89	28
3	M	78	16	82	24
	E	76	20	80	24
4	M	70	19	96	32
	E	78	24	74	30
5	M	64	18	67	20
	E	78	24	72	24
6	M	68	20	78	26
	E	84	18	70	22
7	M	66	18	66	19
	E	66	18	78	22
8	M	68	18	74	20
	E	78	18	70	22
9	M	74	18	78	20
	E	80	20	80	19
10	M	76	18	82	18
	E	78	17	66	20
11	M	70	17	74	20
	E	66	18	68	20
12	M	58	16	76	18
	E	68	18	74	18
13	M	62	18	76	18
	E	74	18	84	20
14	M	66	14	72	16
	E	70	18	88	20
15	M	60	18	72	16
	E	62	18	84	18
16	M	60	18	78	16
	E	76	18	84	20
17	M	86	18	62	16
	E	86	18	64	18
18	M	78	18	66	14
	E	94	22	70	16
19	M	82	18	76	18
	E	82	14	68	16
20	M	80	18	62	16
	E	86	16	64	15
21	M	88	18	64	17
	E	94	20	66	12
22	M	86	15	92	16
	E	104	18	80	16
23	M	88	20	82	18
	E	92	20	72	16
24	M	88	18	84	18
	E	94	20	86	18
25	M	82	21	88	17
	E	94	18	82	14
26	M	80	16	88	18
	E	90	22	84	18
27	M	82	16	92	18
	E	96	18	94	16
28	M	84	18	80	18
	E	96	18	84	16
29	M	86	18	88	18
	E	66	20	100	18
30	M	88	19	82	16
	E	96	18	94	18
31	M	86	18	80	18
	E	104	18	84	16
Nov. 1	M	86	18	82	16
	E	90	18	94	18
2	M	82	20	84	20
	E				

sible which offered the nearest approach to a specific in this disease. We had reached the conclusion that quinia was the remedy *par excellence*, simply because we had used it exclusively, but, for want of experience with other remedies, were in doubt whether or no this one belonged to that large class of *post hoc, ergo propter hoc* remedies, so frequently appealed to.

Oct. 1. No perceptible improvement; unable to sleep; complains of pain, referred principally to occiput; slight nausea from medicine; no emesis; bowels constipated; no appetite. Ipecac., gr. xv three times a day, magn. sulph., ℥ss at once.

2d. Slept a little during night; headache continues; bowels open; urine sp. gr. 1024, acid, slight trace of chlorides; no albumen.

3d. Comfortable night; tongue still heavily coated and swollen; teeth covered with sordes; mouth foul; breath very offensive; complains of pain all over body.

4th. Bowels moved spontaneously during night; urinated freely; pain in head, lungs, and abdomen less severe; profuse sweat from 6 to 8 P.M.; no chill; oil-silk jacket to chest; quiniæ sulph. gr. xv, acid. hydrobromic. ʒss, at 11 A.M. and 8 P.M.; slop diet; urine, sp. gr. 1022, acid, no albumen, chlorides present; patient flighty. This was the seventh day since last chill. We had continued the use of ipecac. with very slight or no perceptible effect upon the fever, and fearing further experiment, administered quinia, with decided advantage. Up to this time, the evening temperature ranged above 104° F. On the 4th inst., 7 A.M., it stood at $104\frac{2}{5}$°; at 7 P.M. $100\frac{2}{5}$° F., with decided improvement in all symptoms. The oil-silk jacket was ordered to protect thorax from chill, patient frequently throwing covering from him during night.

5th. No pain; has been very comfortable for twenty-four hours; mind collected; bowels open; urinary secretion free; no eruption on body; tongue very thickly coated and slightly yellow; expectoration stringy, but not rusty; breath very foul; appetite poor.

6th. No change, except profuse sweating from 1 P.M. till midnight; quiniæ sulph. gr. xvi, acid. hydrobromic. ʒj at 11 A.M. and 8 P.M.

7th. Sensation of heat all over body; otherwise very comfortable; no indication of rash; tongue thick and flabby, with heavy whitish coat, but always clear at tip and edges; expectoration whitish and stringy, essentially that of bronchitis, now without capillary complications; no pain upon inspiration.

8th. Appetite improving; otherwise no change; has been entirely rational since 4th inst., and seems in good spirits.

9th and *10th.* General symptoms unchanged; bowels and kidneys acting regularly; temperature erratic, with upward tendency. *9th.* Quiniæ sulph. gr. xv, acid. hydrobromic. ♏xv at 9 P.M. *10th.* Quiniæ sulph. gr. xv, acid. hydrobromic. ♏xxx at 11 A.M. and 9 P.M.

11th. Comfortable night; felt chilly during morning; no eruption on skin; cold sponge-bath for 20 minutes, when temperature exceeds 103° F. (one bath given at 12 M.); perspired freely from 6 to 9 P.M., and continued to perspire less freely through night; urine, sp. gr. 1028, acid, no albumen, chlorides present.

12th. Very weak, but feels generally better; emunctories working freely; tongue clearing off; expectoration decreasing; no pain; no eruption; quiniæ sulph. gr. xv, acid. hydrobrom. ♏xv at 9 P.M.

13th to *15th*. No marked change; some perspiration during night of 13th, but no chill; tongue still heavily coated; vini albi ℥iv during day (continued from 13th to 22d). (*14th* inst.) Quin. sulph. gr. xv, acid. hydrobrom. ♏xv at 9 P.M. (*15th* inst.) Quin. sulph. gr. x, acid. hydrobrom. ♏xv at 9 P.M.

16th. After a quiet night, at 9 P.M. had severe chill, which lasted fifteen minutes, followed by fever reaching 106⅕° F., and gradually declining; there were no symptoms other than those observed in simple intermittent. Urine, sp. gr. 1020, *alkaline*, chlorides present in full quantity; quin. sulph. gr. xv, acid. hydrobrom. ♏xv at 10.30 A.M., and 9 P.M.

17th. Slept well and feels better; appetite improving; tongue still somewhat coated; expectoration slight; no fetor of breath; no bad taste in mouth; bowels constipated; magn. sulph. ℥ss at 6.30 P.M.

18th to *Nov.* 2. During this time, convalescence proceeded to complete recovery. Quinia was administered sufficiently often to keep system under its influence until 22d inst., at which time all medication was stopped. Specific gravity of urine descended to 1013, but albumen was at no time present. Convalescence, once established, rapidly proceeded to recovery, and patient seemed to have regained full strength several days before opportunity offered to join his proper command. Lung complications (for we take it that the pulmonary difficulty was simply a complication, not a necessary concomitant) rapidly disappeared with increasing strength, and at date of return to duty, patient to all appearance was entirely well.

Case III.—Aged 17 years; medium constitution; general health good. First taken sick crossing Big Horn Mountains (about September 8th) while exposed to snow-storms; complained of soreness all over body and stiffness in joints; some headache; had two or three chills before reaching Camp Brown, Wyoming, but continued to perform full duty until two days after leaving, at which time he became worse; had a severe chill, followed by fever and sweat; taking tertian form until 27th inst., when fever became continuous; never before had chills and fever; during summer was not ill; had no diarrhœa, on the contrary, was constipated; while marching across mountains drank a great deal of water, without effect on bowels; appetite continued good; mind rational; had cold in head, but no trouble with lungs; noticed red pimples on chest and abdomen two days before reaching Camp Brown, which disappeared in two or three days; felt badly for several days before first chill; did not have nose-bleed. Admitted to hospital September 29th, P.M.; face slightly flushed; conjunctiva clear; tongue heavily covered in middle, clear and pink at tip and edges; coating slightly yellowish (tobacco stain?); thorax clear on percussion; respiration normal vesicular; no pain upon full inspiration; bowels constipated; slight tenderness of abdomen, less marked over region of liver; heart normal; pulse full; skin dry; no eruption on body; complains of headache and thirst; otherwise comfortable; appetite good.

29th. Magn. sulph. ℥ss and simple enema at once, followed by potassii bromid. et chloral hydrat. āā gr. xv; slop diet. P.M., T. 104.2° F., P. 87, R. 28.

30th and *Oct.* 1. General condition unchanged; bowels moved freely; headache disappeared; complained of hunger. Sept. *30th*. A.M., 103.2° F., P. 88, R. 26; P.M., 104.4° F., P. 88, R. 27; Oct. 1. A.M., 103.2° F., P. 82, R. 24; P.M., 104.4° F., P. 88, R. 26. Urine, quantity about normal; sp. gr. 1021, alkaline, no albumen, chlorides present; liq. ammon. acetat. ʒss every 3 hours (an experiment).

2d. Sleepless night; tongue clearing; face flushed; fever high; complains of no pain, and seems bright and perfectly rational. A. M., 101.4° F., P. 78, R. 25; P. M., 104.6° F., P. 84, R. 26.

3d. Growing weaker, but makes no complaint; appetite still good; bowels constipated; fever very high; continue liq ammon. acetat., quiniæ sulph. ʒss, acid. hydrobrom. ♏xxx, in two doses at 7 P. M.; magn. sulph. ℥ss in morning. A. M., 102.8° F., P. 86, R. 25; P. M., 104.4° F., P. 90, R. 24.

4th. It will be observed that at 7 P. M., 3d inst., the thermometer indicated a temperature of 104.4° F., at which time a large dose of quiniæ sulph. was given. Passed a comfortable night; quite drowsy in morning; tongue clearing; breath offensive; tenderness of abdomen diminishing; appetite still good; urine, sp. gr. 1012, acid, no albumen, chlorides in increased quantity. A. M., 99.2° F., P. 72, R. 22; P. M., 102.2° F., P. 78, R. 28.

5th to *7th.* No marked change. *5th.* Bowels being constipated, a simple enema was ordered 11 A. M., followed by small evacuations; in evening had quiniæ sulph. ʒss, acid. hydrobrom. ʒj, in two doses at 7 P. M. *6th.* Magnesia sulph. ℥ss. *7th.* Quiniæ sulph. gr. xv, acid. hydrobrom. ʒss at 10 A. M. and 9 P. M. *5th.* A. M., 101.2° F., P. 80, R. 26; P. M., 103.4° F., P. 88, R. 26. *6th.* A. M., 100.4° F., P. 78, R. 22; P. M., 103.2° F., P. 84, R. 28. *7th.* A. M., 102.6° F., P. 82, R. 23; P. M., 104.4° F., P. 90, R. 28.

8th to *10th.* In spite of high temperature, appetite continues reasonably good: complains of the insufficiency of gruel and broth diet; says he is always hungry. *8th.* Perspired considerably during morning; bowels were open; kidneys acting freely; chlorides present in urine in full quantity. A. M., 101.4° F., P. 80, R. 22; P. M., 104.2° F., P. 88, R. 28. *9th.* Quiniæ sulph. gr. xv, acid. hydrobrom. ♏xv, at 11 A. M. and 9 P. M. A. M., 102.6° F., P. 88, R. 28; P. M., 104.2° F., P. 90, R. 28. *10th.* A. M., 101.2° F., P. 96, R. 24; P. M., 104.2° F., P. 88, R. 24.

11th to *12th.* Tenderness of abdomen disappeared; has grown very weak, but mind remains clear, and spirits good; tongue less coated. *11th.* Quiniæ sulph. gr. xv, acid. hydrobrom. ♏xv, at 11 A. M. and 9 P. M.; cold sponge-bath twenty minutes, when temperature exceeds 103° F., to be repeated every half hour, *pro re nata* (bathed three times). Vini albi ℥iv during day. (*12th* to *19th.*) *11th.* A. M., 103° F., P. 94, R. 24; P. M., 103.8° F., P. 84, R. 26. *12th.* A. M., 100.4° F., P. 86, R. 24; P. M., 103.2° F., P. 82, R. 28.

13th. Comfortable night. Tongue characteristically coated; breath offensive; bowels constipated: a papular eruption on chest and abdomen of bright-red colour, painless, and disappearing on pressure (this remained for many days, and the papules multiplied in quantity); sweating profuse 6.30 to 7.15 P. M.; bathed 1 P. M.; magn. sulph. ℥ss 7 A. M.; quin. sulph, gr. xv, acid. hydrobrom. ♏xv at 10 A. M. and 9 P. M. Continue wine. A. M., 100.6° F., P. 88, R. 25; P. M., 103.6° F., P. 90, R. 24.

14th. Slept well through the night; seems bright; sweated copiously; bathed 1, 4, and 7 P. M. Quinia sulph. gr. xv, acid. hydrobrom. ♏xv at 9 P. M. Continue wine. A. M. 98.4° F., P. 82, R. 24; P. M., 104.4° F., P. 98, R. 24.

15th. Sweated for one and one-half hours during night very freely; no tenderness of abdomen; gurgling in right iliac fossa perceptible for first time; somewhat flighty. Bathed 1 P. M.; urine sp. gr, 1016, acid, no albumen, chlorides present in full quantity; bowels constipated; tongue clearing up. To continue wine, and have magn. sulph. ℥ss A. M. A. M., 100.8° F., P. 86, R. 24; P. M., 104.4° F., P. 96, R. 24.

16th to *18th*. No change in general features. 16th. Bowels moved freely during the night; sweating commenced 5.30 P. M.; continued for several hours. Quiniæ sulph. gr. xv, acid. hydrobrom. ♏xv 10.30 A. M. and 9 P. M. A. M., 99.6° F., P. 80, R. 22; P. M., 105.2° F., P. 102, R. 26. 17th. Profuse sweat from 2 till 5 A. M.; sponged at 1 and 4 P. M. A. M., 99.8° F., P. 94, R. 22; P. M., 104.2° F., P. 94, R. 24. 18th. Quiniæ sulph. gr. xv, acid. hydrobrom. ♏xv at 10.30 A. M. and 9 P. M. Wine as usual. Sponged 7 A.M, 1, 4, 7, and 8.30 P. M. A. M., 102.6° F., P. 96, R. 32; P. M., 105.2° F., P. 102, R. 28.

19th. Slept well until 4.30 A. M., then had a severe chill which lasted for an hour. Tongue clearing; no sordes on teeth; very weak, with excessive fever; heart action feeble. Frozen cloths to chest and abdomen; ice cap to head. Sp. vini gallici ℥iv in milk-punch during day. Tinct. digitalis ♏x at 11 A. M. Omit wine. A. M., 105.6° F., P. 132, R. 28; P. M., 101.8° F., P. 114, R. 28.

20th. Had chill from 1 to 2 A. M., followed by high fever; began to sweat at 8.30 A. M., and continued all day; bowels moved freely; stools small and light coloured; frozen cloths applied from 7 to 8 A. M. Quiniæ sulph. gr. xxx, acid. hydrobrom. ♏xxx in two doses at 11 A. M. Omit digitalis; continue brandy. Urine sp. gr. 1015, alkaline, no albumen, chlorides a trace, high coloured. A. M., 104.6° F., P. 128, R. 30; P. M. 97.6° F., P. 102, R. 20.

21st to *24th*. During this time the fever remained comparatively low; patient each day perspired profusely; chlorides in urine increased from a trace to nearly normal quantity. On *21st*, quiniæ sulph. ʒss, acid. hydrobrom. ʒss in two doses 8.30 P. M. A. M., 98.2° F., P. 100, R. 24; P. M., 101.8° F., P. 106, R. 26. *22d*. Quiniæ sulph. gr. xv, acid. hydrobrom. ♏xv at 9 P. M. A. M., 98.6° F., P. 90, R. 22; P. M., 101.2° F., P. 100, R. 24. A. M., 99.4° F., P. 85, R. 22; P. M., 101.6° F., P. 92, R. 24. *24th*. Quiniæ sulph. gr. xxx, acid. hydrobrom. ♏xxx in two doses 7.45 A. M.; atropiæ sulphat. gr. $\frac{1}{40}$ at 8 P. M. Brandy continued. A. M., 100.4° F., P. 86, R. 26; P. M., 101.4° F., P. 100, R. 24.

25th. Had a chill from 5 to 8 A. M.; complained of great thirst; ice cap to head; frozen cloths to chest and abdomen 1 to 4 P. M. Continue brandy; bowels open. A. M., 103.4° F., P. 118, R. 26; P. M., 102.8° F., P. 114, R. 26.

26th. Comfortable night; has good appetite; no pain; no tenderness of abdomen; perspired freely from 8 A. M. to 6 P. M. Had a severe chill at 6.40 P.M., lasting twenty-five minutes, followed by fever. To continue brandy. Atropiæ sulph. gr. $\frac{1}{40}$ morning and night. Quiniæ sulph. gr. xxx, acid hydrobrom. ♏xxx in two doses at 7 P. M. A. M., 98° F., P. 86, R. 20; P. M., 103.2° F., P. 124, R. 27.

27th to *November* 2. A period of almost complete defervescence, during which patient gained strength and improved in every particular; his appetite, as always, continued good, and mind clear, though body weak and spirits occasionally depressed. 27th, was wakeful and thirsty during early night, but slept soundly latter part and during morning. *28th*. Sweated copiously from 6 to 7.30 P. M.; quiniæ sulph. gr. xv, acid. hydrobrom. ♏xv at 10.20 A. M. and 5 P. M.; continue brandy and atropia. *29th* and *30th*. Improvement continued; had (30th) quiniæ sulph. gr. x, acid. hydrobrom. ♏x at 7 A. M. On the 31*st* there was some sweating during day; patient had quiniæ sulph. gr. x, acid. hydrobrom. ♏x at 11 A. M. and 9 P. M. On Nov. 1*st* and 2*d* there was also sweating. 2*d*. Quinia sulph. gr. x, acid. hydrobrom. ♏x at 8 A. M. 27*th*, A. M., 99.2° F., P. 98, R. 24; P. M., 99° F., P. 86, R. 20. 28*th*, A. M., 98.2° F., P. 61, R. 22; P. M., 100.4° F., P. 82, R. 16. 29*th*, A. M., 98.4° F., P. 76, R. 18; P. M., 99.4° F., P. 92, R. 22. 30*th*, A. M., 98.8° F., P. 84, R. 18; P. M., 99.2° F., P. 78, R. 22. 31*st*, A. M., 99.2° F., P. 84, R. 16; P. M., 98.4° F., P. 90, R. 24. Nov. 1*st*, A. M., 98.4° F., P. 82, R. 20; P. M., 99.6° F., P. 84, R. 24. 2*d*, A. M., 99.2° F., P. 84, R. 22; P. M., 99.6° F., P. 96, R. 20.

3*d* to 8*th*. Marks a gradual exacerbation of fever, the morning temperature being normal, or a little above, fluctuated through day, but showing always a quite markedly higher evening register. The specific gravity of urine gave very little indication of severity of fever, and chlorides remained about normal, as had been the case except during the first days of the disease. There was no complaint of pain, no mental hebetude during this time, and appetite continued remarkably good. 3*d*. Quiniæ sulph. gr. v, acid. hydrobrom. ♏x at 9.30 A. M. and 9 P. M. 4*th*. Some sweating during day. Quiniæ sulph. gr. v, acid. hydrobrom. ♏v at 9.30 A. M. and 5 P. M. 5*th*. Sweated at 7 P. M. Quiniæ sulph. gr. x, acid. hydrobrom. ♏x 7.30 A. M. 6*th*. No change, except an appreciable increase in temperature. Quiniæ sulph. gr. xx, acid. hydrobrom. ♏xx at 9 P. M. 7*th*. Passed good night; complained of no pain; appetite good; no thirst. Quiniæ sulph. gr. x, acid. hydrobrom. ♏xx at 11 A. M. and 9 P. M. 8*th*. Fever increasing; has slight headache. Quinia sulph. gr. xv, acid. hydrobrom. ♏xv at 9 P. M. Frozen cloths to chest and abdomen, and ice cap to head from 1.30 till 9 P. M. (intermitting every 20 minutes). 3*d*, A. M., 99.2° F., P. 84, R. 18; P. M., 100.2° F., P. 94, R. 20. 4*th*, A. M., 99.6° F., P. 92, R. 22; P. M., 101.4° F., P. 106, R. 26. 5*th*, A. M., 101.4° F., P. 122, R. 22; P. M., 102.6° F., P. 112, R. 24. 6*th*, A. M., 98.8° F., P. 102, R. 24; P. M., 102.6° F., P. 112, R. 26. 7*th*, A. M., 100.2° F., P. 112, R. 26; P. M., 103.2° F., P. 118, R. 26. 8*th*, A. M., 102° F., P. 108, R. 22; P. M., 104.8° F., P. 126, R. 26.

9*th*. Very restless through night; mind clear, and appetite, as usual, good; bowels open; urinary secretions normal; fever running high; no chill; no sweat; ice to head, and frozen cloths to chest and abdomen almost continuously from 10 A. M. till 7 P. M. At 3 P. M. complained of pain in abdomen, not further localized, which was relieved by sinapism and sol. morph. sulph. (gr. xvj to ℥j) ♏v hypodermically, and disappeared in an hour. Urine sp. gr. 1018, acid, no albumen, chlorides normal. A. M., 102.6° F., P. 112, R. 24; P. M., 105.6° F., P. 124, R. 23.

10*th*. Slept well; continues to enjoy food; no delirium; ice cap and frozen cloths applied at usual intervals from 1 to 7.30 P. M., during which time patient complained of headache. Quiniæ sulph. gr. xxx, acid. hydrobrom. ʒss at 8 A. M.. A. M., 104° F., P. 112, R. 23; P. M., 102.8° F., P. 110, R. 24.

11*th*. Rested comfortably; bowels open; urinated at regular intervals; ice cap and frozen cloths applied, with stated intermissions, from 10 A. M. till 12.30 P. M., 4 to 6.30 P. M. Epistaxis frequently throughout day (a new feature in case). Quiniæ sulph. gr. xxx, acid. hydrobrom. ♏xxx at 10 A. M. Urine, sp. gr. 1021, alkaline, no albumen, chlorides normal. A. M., 103.4° F., P. 110, R. 26; P. M., 99.8° F., P. 112, R. 18.

12th. Slept most of night; feels very comfortable, and has not lost zest for food. At 3 P. M. complained of stomach ache, relieved by sinapism. Diet restricted entirely to gruel, soups, etc., with eggs (cooked rare). Continued to take sp. vini gal. ℥iv daily in form of milk-punch. Though body had become emaciated, considerable strength remained—sufficient to enable patient to move with slight assistance from one bed to another. Quiniæ sulph. gr. xxx, acid. hydrobrom. ♏xxx at 8.30 P. M. A. M., 100.4° F., P. 110, R. 20; P. M., 103.8° F., P. 126, R. 23.

13th. Patient for first time complains of fever; says he feels "hot," though he reports a comfortable night. Fever is telling upon strength; heart action rapid and somewhat irregular; pulsation weak. Ice cap and frozen cloths applied at usual intervals from 10 A. M., to 9 P. M.. Tr. digitalis et tr. ferri chlor. āā ♏x four times daily. Brandy increased to ℥viij in twenty-four hours. Urine, sp. gr. 1025, alkaline, chlorides present. A. M., 102° F., P. 118, R. 22; P. M., 105.2° F., P. 128, R. 30.

14th. Pulse very rapid and weak; heart's impulse hardly perceptible; mind perfectly clear; tongue but slightly coated; teeth without sordes; sweated profusely through morning. Diet restricted to milk with lime-water, together with brandy. Digitalis and iron continued. Quiniæ sulph. gr. l, acid. hydrobrom. ♏l at 7.30 A. M. A. M., 104.8° F., P. 126, R. 22; P. M., 101° F., P. 108, R. 24.

15th. Very restless night; no delirium; tongue, which had nearly cleaned off, again thickly coated characteristically, tip and edges being clear and pink; fever very high; ice cap and frozen cloths applied at regular intervals from 1.30 to 7.30 P. M. 2.45 P. M. complained of pain in bowels, relieved by sinapism. Digitalis and iron continued. Quiniæ sulph. gr. xxx, acid. hydrobromic. ♏xxx at 8.30 P. M. Urine, sp. gr. 1024, acid; chlorides present. A. M., 101.2° F., P. 108, R. 26; P. M., 104.4° F., P. 112, R. 26.

16th. Slept well all night; feels drowsy and weak; perspired freely during night, completely saturating bed clothing. Heart's action more regular and stronger; bowels open; urinates regularly. Ice applied three times during afternoon. Digitalis and iron continued. A. M., 100.4° F., P. 102, R. 28; P. M., 104.4° F., P. 130, R. 28.

17th. Rested easily, and would feel very comfortable were it not for sweat, which keeps him in perpetual bath; tongue thickly coated and breath offensive; teeth clean; sweat continued all day. Quiniæ sulph. gr. xl., acid. hydrobrom. ♏xl. 7.30 A. M., atropiæ gr. $\frac{1}{50}$ morning and night. Omit digitalis and iron. A. M., 104.2° F., P. 118, R. 26; P. M., 101° F., P. 112, R. 28.

18th. Sweating still continues, not very profuse, and chiefly observable in morning; pulse stronger and less frequent; tongue still heavily coated; appetite has disappeared entirely; urine, sp. gr. 1019, acid; chlorides. A. M., 101.6° F., P. 96, R. 28. P. M., 101.8° F., P. 98, R. 26.

19th. No marked change; feels very weak and has no desire for food; tongue and throat dry; pupils dilated. Quiniæ sulph. gr. xxx, acid. hydrobrom. ♏xxx at 10 A. M. Omit atropiæ sulph. A. M., 101° F., P. 98, R. 26. P. M., 99.6° F., P. 106, R. 28.

20th. Slight improvement; slept well and feels comfortable; eruption on chest and abdomen still present; no pain on pressure over any part of abdomen; tongue slightly clearing; heart's action stronger and more regular. A. M., 100.2° F., P. 98, R. 22. P. M., 101.4° F., P. 110, R. 24.

21st to December 16. During this time convalescence may be said to have been established, and the case completed with hardly a symptom worthy of remark. 21st A. M., 99.2° F., P. 95, R. 22. P. M., 99.8° F., P. 106, R. 28. 22d A. M., 97° F., P. 98, R. 22. The tenor of the record is simply improvement. Quinia was given in five-grain doses from time to time sufficient to keep the system under its influence. The bowels, somewhat inclined to constipation, were kept open by occasional doses of Rochelle salt. Slop diet was resumed on November 25th. On 28th brandy was discontinued, vini albi ℥vj, substituted, and this on Dec. 10th was reduced to ℥iv. Dec. 12, full diet ordered. Dec. 16th, patient proceeded to join his company at Fort D. A. Russell, and we have since heard that he entirely recovered.

CASE IV.—Aged 23 years; powerful physique; family history good; temperate habits. Following is an extract from early history of case by patient, written at our request: "Came into this country during latter part of February, 1878; stationed at Omaha Barracks. May 24th station changed to Fort Laramie. May 26th joined 5th cavalry, and proceeded to the site of the new post, Fort McKinney, on Clear Fork, Wyo. Remained in camp at this point and immediate vicinity three months. During this time I went on various scouts, to Custer battle-field, Lodge Pole, and Crazy Woman's Creek. Health was excellent; I never felt better in my life. Early in September marched for Camp Brown, third day crossed Big Horn Mountains, camped on Bates Creek; four inches of snow during night; marched all next day through heavy snow storm, wet and chilled through; next night went to Indian camp, which was in damp place, stayed two hours, came away feeling chilly, and noticed my neck was slightly stiff; next day felt quite chilly, neck worse, that evening saw doctor, he called complaint intermittent fever, gave quinia and compound cathartic pills. Reached Brown in ten days; riding in hot sun and fatigue had made me much worse; remained at Brown four days, then set out for Fort Fetterman, reached that post after a ten days' march." Never had typhoid or any other fever—except intermittent eight years ago, which illness lasted six weeks—subsequently had occasionally chilly feeling, but no regular attack of disease. Since May 26th been continuously in the field far from all settlements. Before attack bowels were regular, had no catarrh in head or lungs and no epistaxis. Disease was not ushered in by regular chill, but rather a chilly sensation (occurring only twice); had daily for two weeks more or less high fever, lasting a short time, and followed by sweat; appetite poor; bowels constipated; no tenderness of abdomen, and no rash on body; principal cause of complaint a severe pain in back of neck, but no headache; has indistinct recollection of what happened after leaving Brown.

Transferred for treatment Sept. 28th, 4 P. M., at which time symptoms were severe nasal catarrh, and acute bronchitis, with free secretion; no pain; no abdominal tenderness except over region of liver, which organ is slightly enlarged; no eruption on body; heart action strong and regular; pulse full; fever high; mind wandering; tongue thick, flabby, coated at centre, clear on tip and edges; breath fetid; bowels constipated, urine scanty and high coloured; excoriation over sacrum.

28th. Pil. Hydrarg. gr. x, 7 P. M., to be followed by Rochelle salt ℥ss in early morning. P. M., 105.4° F., P. 100, R. 18.

29th. No sleep; copious movements of bowels in night and day. 6 P. M., had involuntary passage of feces and urine, fouling bed. 9 P. M., sweating profusely; mind wandering but controllable; no pain. Liq. ammon. acetat. ʒij every two hours. Milk diet. A. M., 103.6° F., P. 100, R. 28. P. M., 104° F., P. 100, R. 22.

30th. Slept nearly all night; mind flighty; tongue dry and glazed; saliva thick and viscid; no sordes; throat sore; pain in right iliac fossa on pressure; bed sore forming on buttocks; bowels open A. M., passage small, flaky, light yellow color; urinary secretions free. To continue treatment and have sponge bath whenever temperature exceeds 103° F. A. M., 101.8° F., P. 94, R. 26. P. M., 103.4° F., P. 100, R. 24.

Oct. 1. Restless and flighty through night, cough frequent; nasal catarrh improving; tongue clearing slightly; conjunctiva injected; appetite good. 10 P. M. in profuse sweat preceded by slight chill. Cold sponge bath 9 A. M. Quiniæ sulph. gr. xv, acid. hydrobrom. ♏xxx, at 11 A. M. and 8 P. M., continue liq. ammon. acetat. A. M., 102.8° F., P. 100, R. 28. P. M., 103° F., P. 102, R. 22.

2d. Wakeful and wandering till 6 A. M., then slept most of day; urinates in bed; is irritable when awake; mind controlled by effort of will. Simple enema 7 P. M., followed by copious light-coloured evacuations; bed-sore spreading; slight perspiration in evening. Omit liq. ammon. acetat. A. M., 98° F., P. 96, R. 24. P. M., 102.4° F., P. 98, R. 28.

3d. Delirium well marked, requires constant watching to prevent escape from bed; only complains of hunger; urinary secretions regular, and, as usual, voided in bed. Quiniæ sulph. gr. xv, acid. hydrobrom. ♏xxx at 11 A.M. and 7 P.M. A. M., 100.4° F., P. 88, R. 24. P. M., 101.8° F., P. 92, R. 28.

4th. Comfortable night; catarrhal symptoms disappearing; tongue less thick and coated; simple enema 11 A. M., followed by two dejections; mind very much more collected; recognizes friends and converses with them rationally. Cold sponge bath 4 P. M. A. M., 100.4° F., P. 84, R. 28. P. M., 102° F., P. 88, R. 24.

5th. Delirious through night, flighty and nervous through day; urinated in bed; bed sores not improving though all care is taken to prevent fouling and pressure; appetite very good. Cold sponge 8 A. M. and 4 P. M. Quiniæ sulph. gr. xv, acid. hydrobrom. ♏xxx 7 P. M., chloral. hydrat. gr. xv at 10.30 P. M., to be repeated at 12 P. M. if necessary. A. M., 101.6° F., P. 76, R. 28. P. M., 102.8° F., P. 90, R. 22.

6th. Slept well till 2 A. M., became restless. Chloral repeated, then slept until 9 A. M.; enjoyed breakfast, and feels well; is still flighty; coughs occasionally with little expectoration; tongue coated, protruded tremblingly and with difficulty; no bad taste in mouth. Cold sponge 9 A. M. and 4 P. M. Simple enema 11 A. M., producing small dejections. Pil. cath. comp. iij 8 P. M., quiniæ sulph. gr. xv, acid. hydrobrom. ♏xxx. 8 P. M. A. M., 100.6° F., P. 84, R. 20. P. M., 100.6° F., P. 88, R. 30.

7th. Quiet sleep till 1 A. M., then becoming restless had chloral. hydrat. gr. x, and rested well till morning; bowels moved twice during night; no pain; mind clear in morning, somewhat flighty during afternoon; tongue still coated, has brassy taste in mouth; nasal catarrh still troublesome. Potassii bromid. gr. xv 7 P. M. A. M., 98.8° F., P. 84, R. 26. P. M., 98.6° F., P. 78, R. 30.

8th. Comfortable night; bed sores still angry; excoriations are appearing on both great trochanters; small boils forming at various points on lower extremities; sat up short time during day. Potass. chlorat. sol.

(gr. xv. to ℥j) for mouth wash. A. M., 98° F., P. 88, R. 28. P. M., 99° F., P. 88, R. 24.

9*th*. Little sleep till 5 A. M.; fouled bed twice with urine; asleep during morning; simple enema was given to relieve constipation (non-effective); appetite voracious; no eruption on chest or abdomen; lungs clear; liver and spleen very little if any enlargement. Quiniæ sulph. gr. xv, acid. hydrobrom. ♏xxx 4 P. M., pil. cath. comp. ij 9 P. M. A. M., 100.2° F., P. 100, R. 32. P. M., 100.2° F., P. 100, R. 28.

10*th*. Rested well after chloral hydrate, gr. x, 11 P. M. Sat up most of day; mind perfectly clear; had passage from bowels after simple enema; feces hard, lumpy, and light coloured. A. M., 98° F., P. 92, R. 24. P. M., 100.2 F., P. 100, R. 28.

11*th*. Slept twelve hours, seems greatly improved; tongue clearing off; general condition promising; mind clear; bed sores healing; boils, of which fresh crops appear almost daily, very troublesome; appetite good; bowels constipated. Quiniæ sulph. gr. xv, acid. hydrobrom. ♏xxx 7 P. M., pil. cath. comp. iij 9 P. M. A. M., 98.4° F., P. 84, R. 28. P. M., 100.2° F., P. 100, R. 24.

12*th*. Bowels moved during night, otherwise slept undisturbed; another movement at 2 P. M., dejections soft and light coloured; nasal catarrh almost disappeared; strength rapidly returning; sits up most of day and enjoys reading. A. M., 98.4° F., P. 88, R. 20. P. M., 98.8° F., P. 100, R. 22.

13*th*. No change. Pil. cath. comp. iij 8 P. M. A. M., 98° F., P. 84, R. 20. P. M., 98° F., P. 100, R. 20.

14*th*. Wakeful and restless through night; fouled bed with urine; sat up most of day and had excellent appetite; mind rational. Quiniæ sulph. gr. xv, acid. hydrobrom. ♏xv 9.30 P. M. A. M., 99° F., P. 96, R. 20. P. M., 100.2° F., P. 96, R. 20.

15*th*. Fouled the bed. This non-control of bladder arises from no functional difficulty, but is due simply to weakness, and in part to want of mental balance. Says he feels perfectly comfortable, sits up most of the day, reads and talks understandingly; tongue clear; bed sores improving; boils still appearing in fresh crops; perspired during night and had bad dreams. A. M., 98° F., P. 96, R. 20. P. M., 101.6° F., P. 100, R. 20.

16*th*. No change. Abscess of parotid gland, right side, opened (with lancet), discharging pus freely. Quiniæ sulph. gr. xv, acid. hydrobromic. ♏xv 7 P. M., pil. cath. comp. iij 9 P. M. A. M., 101.2° F., P. 120, R. 16. 9 P. M., 100.6° F., P. 120, R. 16.

18*th*. Had Rochelle salts ℥j A. M.; quiniæ sulph. gr. xv, acid. hydrobrom. ♏xv at 7 P. M. A. M., 98° F., P. 96, R. 16. P. M., 101.4° F., P. 100, R. 20.

19*th*. Comfortable night; had two motions from bowels; urinated freely; apparently convalescent; is growing stronger; has, as always, excellent appetite, and feels well in every particular. Boils, still numerous, give occasional discomfort. Has been entirely rational for several days; perspires daily but not excessively. A. M., 98.4° F., P. 100, R. 20. P. M., 101° F., P. 100, R. 16.

20*th* to 25*th*. Case progressed very favourably; bowels moved regularly; appetite continued remarkably good; strength increased daily. On 22*d* dressed without assistance, walked about room, and during day wrote several letters. 21*st*. Quiniæ sulph. gr. x, acid. hydrobrom. ♏x 7 P. M. 22*d*. Quiniæ sulph. gr. v, acid. hydrobromic. ♏xv 7 P. M., repeated 7

P. M. 23*d*. 20*th*. A. M., 99° F., P. 96, R. 16. P. M., 99° F., P. 96, R. 16. 21*st*. A. M., 98.4° F., P. 96, R. 16. P. M., 99.2° F., P. 88, R. 16. 22*d*. A. M., 100.4° F., P. 100, R. 16. P. M., 99.2° F., P. 96, R. 16. 23*d*. A. M., 99.8° F., P. 100, R. 16. P. M., 99.2° F., P. 100, R. 16. 24*th*. A. M., 99.2° F., P. 112, R. 16. P. M., 100.2° F., P. 92, R. 16. 25*th*. A. M., 100° F., P. 100, R. 16. P. M., 101.6° F., P. 98, R. 16.

26*th*. Restless night; pain in left side over region of spleen, which organ is considerably enlarged; tenderness in hepatic region; feels weak and inclined to keep his bed, though more comfortable when sitting up; has pain upon taking full inspiration; cannot lie on right side; no pulmonary lesion. Quiniæ sulph. gr. xv, acid. hydrobrom. ♏xxx 7 P. M. A. M., 101° F., P. 100, R. 16. P. M., 102.6° F., P. 104, R. 20.

27*th*. Slept well; still complains of sharp stitch-like pain in left side; emunctories working freely. 12 M. Quiniæ sulph. gr. x, acid. hydrobrom. ♏x. 2 P. M., had a severe chill, lasting half an hour, followed by fever and sweat. A. M., 101° F., P. 100, R. 16. P. M., 106° F., P. 124, R. 20.

28*th*. A. M., 99.4° F., P. 88, R. 16.

From this time case went on to rapid and satisfactory recovery; for several days the evening temperature ran up above 100° F., then gradually receded to the normal. The pain in left side did not entirely disappear for ten days. Nov. 4th patient took a short walk in open air, and continued to do so each pleasant day until he left this station (15th). So soon as exercise began the bowels became regular, strength returned very rapidly. Quinia was continued in decreasing doses at stated intervals until 3d inst.

CASE V.—Aged 32 years; taken sick about September 10, 1878, while crossing Big Horn Mountains with command. Previous history very meagre; patient upon admission and afterwards being in no condition to give information. It will be observed that the case was transferred as quotidian intermittent. We learned from surgeon in charge that patient's principal complaint was severe pain in back of head and neck. In a lucid interval patient told me attack was ushered in by headache and pain in bones; he had no diarrhœa, bowels being generally regular, but micturition difficult.

Admitted to hospital September 29th, P. M. Medium-sized man; large head; light hair; spare habit; body considerably emaciated; strength greatly reduced; mind wandering; tongue almost normal size, slightly coated in centre, clear and pink at tip and edges; teeth clean; conjunctiva clear; pupils reacting equally. On back of neck scar, evidently of recent blister; thorax somewhat dull all over on percussion; respiration superficial; slight roughness upon inspiration; heart action weak, otherwise normal; abdomen, without eruption, generally tender on pressure; liver enlarged and tender; spleen enlarged, but not painful upon palpation; no appetite; thirst great; throat slightly sore; expectoration viscid and whitish; no pain in chest or abdomen, but severe pain in back of head and neck.

29*th*. Solution morphiæ sulph. (gr. xvj to ℥j) ♏v, hypodermically, to relieve pain, *p. r. n.* Milk diet; sponge bath. A. M., 104.8° F., P. 82, R. 30.

30*th*. Restless and delirious through night; complains of headache. Continue morphia *p. r. n.*, and have quiniæ sulph. gr. iij every three hours. A. M., 102.8° F., P. 78, R. 28. P. M., 102.2° F., P. 78, R. 28.

Oct. 1st. No change; mind wandering, but controllable; pain in head still very severe. Continue treatment. A. M., 101.8° F., P. 78, R. 26. P. M., 102.8° F., P. 80, R. 24.

2d. Tongue clearing; headache somewhat relieved; restless during night; not as weak as symptoms would lead to expect; heart action good; micturates regularly and without much difficulty; urine, sp. gr. 1024, acid, albumen a trace, chlorides a trace. Continued treatment, and add atropiæ sulph. gr. $\frac{1}{60}$ to morphia for hypodermic injection. A. M., 102.4° F., P. 70, R. 20. P. M., 104.6° F., P. 14, R. 24.

3d. Seems to feel a little better this A. M., probably due to naps caught during night; head still aching, and abdomen very tender; bowels constipated. Quiniæ sulph. gr. xv, acid. hydrobrom. ♏xxx morning and night; magn. sulph. ℥ss, A. M. Milk and gruel diet. A. M. 103.2° F., P. 74, R. 22. P. M., 102.8° F., P. 80, R. 20.

4th. No change except less pain in head; bowels open during night; sleepless and wandering; some appetite, and considerable strength. Omit treatment. A. M., 100.2° F., P. 78, R. 20. P. M., 102.6° F., P. 72, R. 26.

5th. Still flighty and restless; complains of no pain, but mind in such condition of hebetude that little can be learned regarding sensations; urinates freely; bowels open; expectoration thick and slightly rusty; subcrepitant râles in right lung; abdomen still tender; profuse sweat 6.30 to 8 P. M. Quiniæ sulph. gr. xv, acid. hydrobrom. ♏xxx at 11 A. M. and 8 P. M. Urine, sp. gr. 1022, acid, albuminous, chlorides present. A. M., 101.6° F., P. 72, R. 20. P. M., 102.8° F., P. 72, R. 20.

6th. Comfortable night; tongue clearing; teeth without sordes; still complains of pain on pressure over liver; expectoration viscid with slight rustiness. A. M., 100.6° F., P. 72, R. 20. P. M., 102.8° F., P. 84, R. 20.

7th. Feels well; mind collected; still has pain in right side; expectoration viscid, but not rusty; no albumen in urine; heart's action regular and strong; strength fair. Quiniæ sulph. gr. xv, acid. hydrobrom. ♏ xxx, 10 A. M. and 9 P. M. A. M., 101.4° F., P. 78, R. 19. P. M. 103.8° F., P. 86, R. 24.

8th. Generally improved; slept well and feels quite bright; entirely rational. Omit medicine. A. M., 99.6° F., P. 76, R. 18. P. M., 102.6° F., P. 78, R. 22.

9th. Symptoms at morning visit favorable; slept most of night; is without pain, and has quite an appetite, though still confined to soups and gruels; mind perfectly clear. 9.15 P. M., complained of severe pain in bowels, of colicky character; ordered sinapism, enema. terebinth., Magendie's solution morph. ♏v (hypodermically), and repeat in one hour if necessary; quiniæ sulph. gr. xv, acid. hydrobrom. ♏xv, at 10 A. M. and 9 P. M. Urine, sp. gr. 1024, acid, no albumen. A. M., 99.8° F., P. 74, R. 20. P. M., 102.4° F., P. 82, R. 18.

10th. Slept very little; had colicky pain more or less through day; abdomen hard and tender to touch; somewhat relieved by sinapisms and hypodermics of morphia. At 9.30 P. M. pain became excessive; morphia and mustard continued, the latter substituted by turpentine stupes. 10.30 P. M., brandy ℥j; cold cloth to head. A. M., 101.2° F., P. 84, R. 22. P. M., 104.4° F., P. 116, R. 28.

11th. Great prostration; heart's action weak; breathing costal; abdomen tender in all directions, hard and tympanitic; perspiration cold and profuse; delirious; both pupils contracted (from opium); turpentine stupes and morphia continued, with brandy. A. M., 105.2° F., P. 138, R. 14. Died at 11.35 P. M.

Necropsy.[1]—Omentum contains considerable fat, is very much injected, and has numerous adhesions to intestines; liver increased by about one-half its size, of dark-brown colour, smooth surface, no abdominal adhesions, somewhat softened and filled with blood; gall-bladder very much distended, contains no calculi; spleen about twice normal size, capsule tense, and so friable that it ruptured on removal under most delicate manipulation; parenchyma pulpy, of blackish-red colour, and almost liquid consistency, being gorged with black blood; peritoneal cavity contains a thin yellow fluid of fecal odour; peritoneum above umbilicus is reddened and somewhat rough with slightly velvety appearance, below umbilicus there is a thin transparent layer of coagulated fibrine with occasional opaque patches; intestines covered with a rough-whitish layer, and matted together, contents fluid, no hardened masses; eighteen inches from caput coli was found a perforation of ileum, through which the same yellowish fluid, seen in peritoneal cavity, was pouring out; internally the whole intestinal canal was covered with mucus and epithelial masses, which exudation was most marked in ileum and colon; about the ileo-cæcal valve (within twenty-four inches) in small intestine, were several well-defined elevations of circular form, the periphery being raised ridge-like, a line above the general surface, the size of these plaques was about that of a half-dime piece. At a point corresponding to the rupture already mentioned, was found what was evidently an ulcerated Peyer's patch, with its centre as though punched out by a cutting instrument. There was also enlargement of the solitary glands; kidneys large, smooth, and white, right weighing $8\frac{1}{2}$ ounces, left 9 ounces (not examined internally); both lungs were universally adherent to pleura (adhesions very firm); heart small, flabby, and of yellowish colour; pericardium contains but little fluid; blood very dark coloured; thoracic viscera not examined internally; dura mater strongly adherent to cranium, pia mater injected, arachnoid covered with patches of pearly exudation; brain substance soft.

In reviewing the foregoing clinical histories it is reasonable to assume that the external causes of disease were identical, since the outward conditions of the patients were entirely similar. True this is only an assumption, incapable of absolute proof, but certainly plausible, and the truth of which is demonstrable up to a point rarely reached in such investigations.

It will be observed that the command had been absent from permanent settlements four months, sufficiently long to preclude the probability of the *materies morbi* having remained latent from the time the column first took field until the disease appeared. Between June and September the troops did not approach any settlement save that of Camp Brown, where they remained but a few days, and intercourse with which during their sojourn was necessarily restricted by discipline of the camp.

Assistant Surgeon C. H. Winne, U. S. Army, Post Surgeon, Fort

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[1] The cranial, thoracic, and abdominal viscera were sent to the Army Medical Museum in as perfect condition as possible, for examination there, which will prevent a very detailed description here.

Washakie, Wyo. (formerly Camp Brown), writes, in reply to request for information as to prevalence of typhoid or typho-malarial fever in 1877 and 1878: "Intermittents and remittents are noted (on hospital record), but neither typhoid nor typho-malarial are noted." Dr. R. B. Grimes, U. S. Army, who was Post Surgeon at Brown, in 1878, and some years previous, states: "I was stationed in the Wind River country over four years, and I am positive that I never met with a case of typhoid fever in that region. . . . I have no reason whatever to believe that there were causes or influences at Camp Brown to generate typhoid."

The first permanent camp of the cavalry was established in a region heretofore almost undefiled by human foot, leaving entirely out of consideration human settlement, and communication with which was, by reason of its very isolation, restricted. The second camp, but a few miles distant, was equally isolated. The road to Camp Brown through the Big Horn Mountains, an almost disused Indian trail (during the march over which in most of the cases the disease manifested itself), was virgin of settlement or civilization. From all of which conditions it would be difficult to imagine any immediate or remote human origin for the disease germs.

A due consideration of the circumstances surrounding the command, leads us to seek for the predisposing causes of disease in or about its camps on Clear and Rock creeks. These rapid streams take source in the Big Horn Mountains, and draw their supply from the snows which perpetually cap the summit of this elevated range. The summer of 1878 was exceptionably hot, so warm indeed that the snow disappeared entirely from many of the peaks, which, according to tradition obtaining among the few trappers who have hunted that region, were never before uncovered. It is to be regretted that a systematic analysis of these waters was not made, but judging from the rough test of taste, their snow origin was unmistakable, and there was "a suspicion of vegetable infusion." More accurate tests would, doubtless, have confirmed this suspicion of organic matter, since at this time the water supply was from snow probably many seasons old, which each year became more and more impregnated with organic germs filtered through superimposed strata. "That these cases," Dr. Gray writes, "were malarial, there is in my opinion no room for doubt, but whence came the toxic germs? Reasoning by exclusion I am compelled to attribute their source to the water formed by the melting snow."

Such conditions would certainly be deemed sufficient to account for any malarial manifestations—and such we may assume were predisposing causes to disease in the foregoing cases; the exciting causes being the hardship and exposure consequent upon the march through the mountains. If there were other causes, immediate or remote, they do not appear.

Conceding the causes of diseases as identical, it logically follows the diseases are similar, and this supposition is borne out by coincidence in mode of onset, symptoms, and course in all cases whose clinical histories have been herein set forth. Case V. presented no special features not attributable to individual idiosyncrasies. On admission, patient seemed more under influence of *materies morbi;* but, so soon as system became amenable to remedies, temperature fell, pain disappeared, appetite improved, and there was fair promise of recovery. But this man undoubtedly had typhoid fever, and died from its effects. Surgeon J. J. Woodward, U. S. A., writes: "In your case the lesions found in the specimens sent to the Museum are those of ordinary typhoid fever;" hence, by the terms of our hypothesis, all these cases must be typhoid.

This conclusion may not be accepted without protest; running water from virgin snow is not generally believed to be deleterious, and certainly not to contain the germ from whence alone typhoid is held to grow. Possibly, Case V. suffered from another disease than the rest; but, if so, there was nothing to indicate the difference.

"Mountain"[1] fever is far from being a typical enteric, even though the latter, save as to its pathology, is a never constant entity. "The diseases which are produced by the specific poison of typhoid fever," writes Liebermeister,[2] "differ a good deal among themselves; some of the diseases are so serious that life is almost inevitably destroyed by them; others are so trifling that patient and physician are left in doubt whether there were really any disease at all; and between these extremes we find every gradation."

In enteric, the fever has a curve marked briefly by a gradual rise, continuance, remission, and finally intermission. The histories of the foregoing cases would indicate that they came under observation here during second and third periods, *i. e.*, continuance and remission.[3] The thermometric records in a general way attest this; there are, however, some sudden and marked deviations which seem to indicate the probability of other than typhoid influences being at work.

It will be observed that, in every case under consideration, there were at intervals, occurring with greater or less regularity, chill, fever, and sweat—frequently all three—inevitably two of these pathognomonic stages of intermittent fever. The recurrence of these symptoms was so frequently observed that they could hardly be regarded as the "after fever" of the

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[1] Writers previously quoted, while not conceding the identity of "mountain" and typhoid fevers in their description of the former disease, certainly give a recognizable picture of the latter. This question of identity finds its counterpart in the discussions of the nature of fevers once supposed to be indigenous to the Appalachian Range, and now generally recognized as enteric.

[2] Ziemssen's Cyclopædia, vol. i. p. 76.

[3] Drs. Smart and Gray give the period of incubation of "mountain" fever as about two weeks. Dr. Williamson (Smart, *American Journal of the Medical Sciences*, 1878) says: "When morbid process is fairly established, you will have a case of disease that will run from three to five weeks before you can see the commencement of convalescence."

Germans, and certainly not as relapses, of which more than two are rarely encountered; moreover, we have to take into consideration the mode of onset of the disease, which at least so closely resembled that of intermittent that the patients were transferred as suffering from this disease in its typical forms.

Although the fever was high and long continued in several cases, in but one (V.) was there an approximation to the *status typhosus*—while in the only other case (IV.), in which head symptoms were at all prominent, the fever was by no means excessive—though both had involuntary dejections. Diarrhœa did not appear; on the contrary, the patients were all more or less constipated; there was no tympanites or meteorismus. In but one (III.) was there anything that approached in appearance the typical roseola. No epistaxis early in any case, and no intestinal hemorrhage. Convalescence was rapid, and the hair did not fall. In two (II. and IV.) there was acute nasal catarrh. Herpes labialis appeared in three (II., III., and IV.).

Imbued with the idea that typhoid fever could not originate *de novo*, or remain latent in the system for a longer period than four weeks, we have been slow to conclude that "mountain" fever was in any wise related to enteric; in fact, we have heretofore advanced the theory that the fever of this region was a subcontinued fever of purely malarial origin; that the temperature curve showed daily exacerbations and remissions of such character as to lead to the belief that we had a mixture of types, but not of diseases. In the light of further experience and pathological anatomy, we are obliged to abandon the position then taken, and acknowledge "mountain" fever as essentially typhoid.

We, however, contend that the morbific causes are not solely those of enteric, but that they are modified by the *materies morbi* of intermittent fever—a fact which we believe to be substantiated: 1st. By deviation from the normal temperature curve of typhoid; 2d. By the difference in many symptoms, which, taken singly, would be of little importance, but, in the aggregate, are entitled to grave consideration; 3d. By the action of quinia, which seems to have a specific effect other than the simple antipyretic influence exerted in typhoid.

From which the following is deduced:—

1st. The fever of the Rocky Mountain region is a hybrid disease, the prominent features of which are typhoid—the modifying, intermittent; is, in fact, the typho-malarial fever of Woodward.[1]

2d. It appears during or after exposure incident to field-service, generally, though not necessarily, in late summer and early autumn, and seems to bear no relation to typhoid infection as now usually accepted by the profession.

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[1] The question of hybridity of disease has no place in this essay; that such mongrels are recognized, at least in our country, "goes without saying;" that they should be recognized in Europe seems conclusively proved by Dr. Woodward (Trans. International Medical Congress, Phila. 1876. Paper on Typho-malarial Fever).

3d. At its inception, this disease manifests itself as an intermittent of quotidian, tertian, or other form; this stage is followed (in about two weeks) by the typhoid stage, lasting in neighborhood of four weeks, in which typical typhoid symptoms may be observed, modified to a greater or less degree by intermittent indications.

4th. The pathological anatomy of the disease is that of typhoid fever.

5th. The treatment should be antiperiodic and antipyretic.

Fort Fetterman, Wyoming Territory, 1879.

Memorandum. By J. J. Woodward, M.D., Surgeon U. S. Army.—Without at present committing myself either for or against the views expressed by Assistant-Surgeon Hoff in the foregoing interesting paper, I wish to state that, besides the specimens from the fatal case he describes (Nos. 1418, 1419 and 1420, Medical Section), the Museum possesses another specimen from a case of the so-called mountain fever, contributed by Assistant-Surgeon A. C. Girard, U. S. A. The patient was a quartermaster's teamster, who died at Fort Keogh, Montana Territory, March 18, 1879. On the autopsy, characteristic typhoid ulcers were found in the small intestine, one of which had perforated and was the immediate cause of death. (The specimen is No. 1482, Medical Section.) Now, it is easy enough for those who have made no autopsies in this disease to be led by speculative considerations to insist, as my friend, Assistant-Surgeon Charles Smart, U. S. Army, has done (this Journal, January, 1878, p. 34), that mountain fever is merely "a malarial remittent with adynamic tendencies;" but such positive observations as those of Drs. Hoff and Girard will serve to show how unsafe it would be to repose confidence in immature generalizations of this kind.

A like criticism applies to the views Assistant-Surgeon Smart has advanced in the same paper (p. 38 *et seq.*) with regard to the camp fevers of the late civil war. Clinical observation in the Army of the Potomac, which even "an occasional autopsy" did not serve to enlighten, have led him to adhere strongly to the opinion that our camp fevers were merely remittents which assumed an adynamic type towards their close, and that they were not often complicated with the typhoid process, which, indeed, he imagines to have been comparatively rare. In a subsequent publication,[1] after insisting that "the camp fevers of this country are malarial, the germ being either air-borne (*malarial*) or water-carried (*aqua-malarial*)," the same gentleman writes of typhoid fever: "In more populated districts, the specific germ of typhoid may add its train of symptoms to the list of camp fevers. It is a disease which has, without doubt, invaded our camps in many instances; but that it figured during the late war—simple or masked by malarial concomitants—as largely as we are called upon to believe by Dr. Woodward, has been shown by the writer to be exceedingly doubtful." In support of the opinion contained in the last clause of this passage, the author refers to his article in this Journal just cited.

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[1] *Hygiene of Camps*, in a work on *Hygiene and Public Health*, issued, in lieu of a translation from the German volume on the same subject, as Vol. XIX. of the American edit. of Ziemssen's Cyclopædia, New York, 1879, p. 148–9.

Now, certainly the testimony of Assistant-Surgeon Smart, recorded in that article, is quite valuable as an addition to a great deal of other evidence of the same kind which tends to show the similitude that existed between the early stages of the majority of the camp fevers of the late war and ordinary malarial fevers; but he himself informs us (this Journal, Jan. 1878, p. 40) that he "saw many such cases in their inception, few comparatively at their termination." Had he been able to follow his fever patients to the hospitals of Alexandria and Washington, he would have learned that, in the great majority of the autopsies made in fatal cases, *unmistakable typhoid lesions* were recognized in the small intestine; and, had he extended his inquiries to the other general hospitals, he would have found that this was equally true of them all. In point of fact, the records of the post-mortem examinations of fever cases made during the civil war fully support the views I have heretofore expressed of the extreme frequency of the typhoid complication; and their publication (in the third medical volume of the *Medical and Surgical History of the War*) will convince the reader that the views expressed by my friend in the two papers to which I have just referred are inaccurate historically, and that their general acceptance would be pregnant with mischief in future wars.

ARTICLE III.

ON A NEW METHOD OF TREATING CHRONIC NASAL CATARRH. By HARRISON ALLEN, M.D., Professor of Physiology in the University of Pennsylvania.

IN the course of my clinical studies in chronic nasal catarrh, I have become interested in a method of local treatment which presents, in my opinion, decided advantages over those ordinarily employed. Method is, perhaps, too complimentary a term to use in speaking of the resources of the physician usually relied upon in treating this obstinate affection. Let me rather say that, in a treatment which has hitherto possessed but little or no method, I have endeavoured to institute one, that I have used with success—a few simple means of reaching and medicating the labyrinthine surfaces of the nasal chambers and the obscure region of the pharyngeal vault.